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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Andrew Moore

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04/13/2009

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EXAMINER

SMITH, JOSHUA Y

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/508,750	<b>Applicant(s)</b> MOORE, ANDREW	
	<b>Examiner</b> JOSHUA SMITH	<b>Art Unit</b> 2419	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 January 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 9-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 9-12 and 14-16 is/are rejected.
- 7) ☒ Claim(s) 13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 01/29/2009 has been entered.

- **Claims 9-16 are pending.**
- **Claims 1-8 are previously cancelled.**
- **Claim 13 is objected to.**
- **Claims 9-12 and 14-16 stand rejected.**

### ***Claim Rejections - 35 USC § 101***

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

**Claim 16** is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. **Claim 16** contains steps that are not tied to an apparatus, and the steps do not inherently require a machine.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**Claim 10** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

**Claim 10** states “the network resource comprises bandwidth of a communications channel fed by the network element **and/or** buffer depth in the network element” (emphasis added by examiner). This is indefinite since it is unclear whether a “network resource” is **both** a “bandwidth” **and** a “buffer depth”, or a “network resource” is **either** a “bandwidth” **or** a “buffer depth”. In addition, if a “network resource” is **both** a “bandwidth” **and** a “buffer depth”, then two resources are involved and the plural ***network resources*** should be stated. Examiner will treat the above excerpt to indicate that a network resource is either a bandwidth or a buffer depth.

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

**Claims 9, 10, 14 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Giroux et al. (Patent No.: US 6,317,416 B1) in view of Qiu et al. ("Measurement-Based Admission Control with Aggregate Traffic Envelopes", April 2001, IEEE Press, IEEE/ACM Transactions on Networking, Vol. 9, No. 2, pages 199, 200, 202, and 203), hereafter respectively referred to as Giroux and Qiu.

**In regards to Claim 9**, Giroux teaches in column 3, lines 12-13, a connection admission controller computes the minimum bandwidth required for each service class (providing a communications network resource to a plurality of classes of use of a network, a different level of service being associated with each class of use).

Giroux also teaches in column 2, lines 11-24, a fair queue servicing arrangement in a multi-service class packet switched network, comprising a weighted fair queuing controller, and buffer means for receiving incoming packets in queues, characterized in that further comprises means for monitoring buffer usage for each queue, means for determining the bandwidth requirements of each class of service, and a service weights manager for dynamically modifying the weights of said weighted fair queuing controller means in response to said buffer usage and bandwidth requirements (a demand

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estimator for estimating a demand for each class, and a dynamic resource allocator for allocating to each class a proportion of a network resource, a proportion allocated being dependent on an estimated demand for each class, and an allocation optimizing use of an available network resource while ensuring a level of service of each class is observed).

Giroux also teaches in column 2, lines 49-52, a service weight manager that dynamically modifies weights to be used by a WFQ Scheduler (a communications network element for providing to each class a proportion of network resource allocated to it).

Giroux fails to teach a demand estimator for estimating a demand by computing two demand estimates for two different timescales.

Qiu teaches in the Abstract, page 199, and a goal of admission control is to support quality-of-service demands of real-time applications via resource reservation, and Qiu teaches in the second and fifth paragraphs of the Introduction, page 199, extant algorithms employ user-specific traffic parameters to estimate aggregate resource demands, but this reliance on each flow's traffic parameters can render statistical services difficult to deploy, and Qiu presents an implementation of an MBAC algorithm for multiclass networks with link sharing and a development of a new theoretical framework of aggregate traffic envelopes (a demand estimator for estimating demand).

Qiu teaches in the second and third paragraphs of section A of part II, page 200, a goal of a measurement methodology is twofold, where, first, by measuring a maximal rate envelope of an aggregate flow, capturing (computing an estimate for) a short time-

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scale (a timescale) burstiness (demand) of traffic, and where an envelope measures a short time-scale (a timescale) burstiness (demand) and autocorrelation structure of an aggregate flow, and Qiu teaches in the second and fifth paragraphs of section A of part II, page 200, measuring a variation of an aggregate flow's rate envelope (demand) to characterize (compute estimate for) longer time scale (a second timescale) fluctuations in traffic characteristics, and where a measuring of variability of an aggregate envelope (demand) over certain time slots to characterize (compute estimate for) a variation of an envelope (demand) itself over longer time scales (a second timescale) (a demand estimator for estimating a demand by computing two demand estimates for two different timescales).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Qiu with the invention of Giroux since Qiu provides an algorithm for statistical services that overcomes the problems of algorithms that require acute reliance on each flow's traffic parameters and allows easier deployment of statistical services for applications that cannot accurately estimate their traffic parameters when a flow is first established and for flows with rate variations over multiple time scales that are not adequately characterized by standard traffic models, which can be introduced into the system of Giroux to aid in guaranteeing a desired Quality of Service for a service class that is beginning to experience traffic and for a service class with rate variations over multiple time scales, improving the resource utilization efficiency in the system of Giroux.

**In regards to Claim 10**, Giroux teaches in column 1, line 62 to column 2, line 3, a method of fair queue servicing at a queuing point in a multi-service class packet switched network, wherein incoming packets are received in buffers and outgoing packets are scheduled by a weighted fair queue scheduler characterized in that real-time information of buffer usage along with the minimum bandwidth requirement is used to dynamically modify the weights of the weighted fair queue scheduler (a network resources comprises bandwidth of a communications channel fed by a network element).

**In regards to Claim 14**, Giroux teaches in column 3, lines 30-33, an Internet-like best effort service that compensates for low utilization of other service classes (a best-effort service is provided as a class).

**In regards to Claim 16**, Giroux teaches in column 3, lines 12-13, a connection admission controller computes the minimum bandwidth required for each service class (providing a communications network resource to a plurality of classes of use of a network, a different level of service being associated with each class of use).

Giroux also teaches in column 2, lines 11-24, a fair queue servicing arrangement in a multi-service class packet switched network, comprising a weighted fair queuing controller, and buffer means for receiving incoming packets in queues, characterized in that further comprises means for monitoring buffer usage for each queue, means for



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determining the bandwidth requirements of each class of service, and a service weights manager for dynamically modifying the weights of said weighted fair queuing controller means in response to said buffer usage and bandwidth requirements (estimating a demand for each class, allocating to each class a proportion of a network resource, a proportion allocated being dependent on an estimated demand for each class, and an allocation optimizing use of an available network resource while ensuring a level of service of each class is observed).

Giroux also teaches in column 2, lines 49-52, a service weight manager that dynamically modifies weights to be used by a WFQ Scheduler (providing to each class a proportion of network resource allocated to it).

Giroux fails to teach estimating a demand by computing two demand estimates for two different timescales.

Qiu teaches in the Abstract, page 199, and a goal of admission control is to support quality-of-service demands of real-time applications via resource reservation, and Qiu teaches in the second and fifth paragraphs of the Introduction, page 199, extant algorithms employ user-specific traffic parameters to estimate aggregate resource demands, but this reliance on each flow's traffic parameters can render statistical services difficult to deploy, and Qiu presents an implementation of an MBAC algorithm for multiclass networks with link sharing and a development of a new theoretical framework of aggregate traffic envelopes (estimating a demand).

Qiu teaches in the second and third paragraphs of section A of part II, page 200, a goal of a measurement methodology is twofold, where, first, by measuring a maximal

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rate envelope of an aggregate flow, capturing (computing an estimate for) a short time-scale (a timescale) burstiness (demand) of traffic, and where an envelope measures a short time-scale (a timescale) burstiness (demand) and autocorrelation structure of an aggregate flow, and Qiu teaches in the second and fifth paragraphs of section A of part II, page 200, measuring a variation of an aggregate flow's rate envelope (demand) to characterize (compute estimate for) longer time scale (a second timescale) fluctuations in traffic characteristics, and where a measuring of variability of an aggregate envelope (demand) over certain time slots to characterize (compute estimate for) a variation of an envelope (demand) itself over longer time scales (a second timescale) (a demand estimator for estimating a demand by computing two demand estimates for two different timescales).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Qiu with the invention of Giroux since Qiu provides an algorithm for statistical services that overcomes the problems of algorithms that require acute reliance on each flow's traffic parameters and allows easier deployment of statistical services for applications that cannot accurately estimate their traffic parameters when a flow is first established and for flows with rate variations over multiple time scales that are not adequately characterized by standard traffic models, which can be introduced into the system of Giroux to aid in guaranteeing a desired Quality of Service for a service class that is beginning to experience traffic and for a service class with rate variations over multiple time scales, improving the resource utilization efficiency in the system of Giroux.

**Claims 11 and 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Giroux in view of Qiu, and further in view of Suni (Patent No.: US 7,149,185 B1), hereafter referred to as Suni.

**In regards to Claim 11**, as discussed in the rejection of Claim 1, Giroux teaches a demand estimator.

Giroux fails to teach using a traffic envelope scheme in which a characterization of traffic flow is conducted over a specified particular period.

Suni teaches in column 9, lines 60-64, a set of peak rates over numerous intervals of different lengths during some measurement window T, and the resulting maximal rate envelope describes the flow's maximal rate as a function of interval length (using a traffic envelope scheme in which a characterization of traffic flow is conducted over a specified particular period).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the invention of Suni with the invention of Giroux since Suni provides a detailed method of using traffic envelopes in measuring data traffic for use in scheduling and queuing data, which can be adopted into the system of Giroux to provide efficient traffic scheduling.

**In regards to Claim 12**, as discussed in the rejection of Claim 1, Giroux teaches bandwidth requirements.

Giroux fails to teach a mean and a variance of consecutive traffic envelopes is determined to estimate effective bandwidth.

Suni further teaches in column 9, lines 60-64, a set of peak rates over numerous intervals of different lengths during some measurement window T, and the resulting maximal rate envelope describes the flow's maximal rate as a function of interval length (consecutive traffic envelopes is determined to estimate effective bandwidth requirements).

Suni also teaches in column 11, lines 27-30, a maximal rate envelope is estimated by determining estimates of mean and variance (a mean and a variance of consecutive traffic envelopes).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the invention of Suni with the invention of Giroux since Suni provides a detailed method of using traffic envelopes in measuring data traffic for use in scheduling and queuing data, which can be adopted into the system of Giroux to provide efficient traffic scheduling.

**Claim 15** is rejected under 35 U.S.C. 103(a) as being unpatentable over Giroux in view of Qiu, and further in view of Knightly et al. (Patent No.: US 6,801,501 B1), hereafter referred to as Knightly.

**In regards to Claim 15**, as discussed in the rejection of Claim 1, Giroux teaches network data traffic.

Giroux fails to teach voice and video data is transferred across a network.

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Knightly teaches in column 1, lines 15-23, and in column 11, lines 60-63, network traffic includes video and audio (voice and video data is transferred across a network).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the invention of Knightly with the invention of Giroux since Knightly provides a method involving a formula that can aid in scheduling data for limited resources and can be adopted into the system of Giroux to enhance its scheduling system for efficient scheduling.

### ***Allowable Subject Matter***

**Claim 13** is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Response to Arguments***

3. Applicant's arguments with respect to claims 9 and 16 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- **Iwakawa et al. (Patent Number: 5,583,860)** teaches in column 11, line 57 to column 12, line 3, and in FIG. 7, a comparing circuit 46 for comparing the

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measurements of a physical transmission line capacity use rate indicating a change in a **long-term demand** and a lost-call rate indicating a change in a **short-term demand**, a determining circuit 47 for comparing an output of the comparing circuit 46 with the redesign determination criterion in the data base 45 and determining whether or not a redesign request is required (a demand estimator for estimating a demand by computing two demand estimates for two different timescales).

- **Qiu et al. (“QoS Control via Robust-Based MBAC”, 1998, IEEE, pages 62-64)** teaches in the upper half of the first column of page 64, a technique to make predictions of maximal future resource demands.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOSHUA SMITH whose telephone number is (571)270-1826. The examiner can normally be reached on Monday-Thursday 9:30am-7pm, Alternating Fridays 9:30am-6pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on 571-272-3088. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Joshua Smith  
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Patent Examiner  
08 April 2009

/Hassan Kizou/  
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